AGRCULTURAL SANITATION:
From 'waste' to resource

by

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STATEMENT

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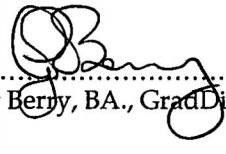
Signed  .....

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ABSTRACT

This transdisciplinary study investigates the potential for safely and sustainably managing human excreta by utilizing this by-product as a fertilizer via alternating batch composting toilets of a specific design. An historical analysis traces the traditional use of human excreta in cultivation, and examines the reasons for the demise of this ancient excreta management strategy in some countries. The study further explores the potential of Agricultural Sanitation providing a modern sustainable method for managing human excreta re-use in traditional settings through field research conducted in Vietnam and Northern Pakistan.

A composting toilet trial conducted on the Central Pacific island of Kiritimati in Kiribati served to test this method of managing human excreta in a challenging cultural and geographic environment where a population has a high incidence of faecally transmitted enteric diseases.

To establish the safety of the composting toilet end-product, fresh faecal samples from composting toilet households on Kiritimati were tested to identify any pathogens being introduced into the toilets. Compost samples from the composting toilets were subsequently tested to assess the survival of any pathogenic organisms through laboratory analyses and the incubation of parasite ova that were removed from the compost. Compost samples from a large publicly used batch composting toilet in the World Heritage Area of Tasmania, Australia, and a domestic batch composting toilet on the North Coast of NSW, Australia were also analysed for pathogen content.

The fertilizer capabilities of the composting toilet end-product was assessed by testing compost samples from the Kiritimati and Australian composting toilets. Total elemental analysis and nutrient availability tests were conducted on the samples. A pot trial was also conducted on Kiritimati and a glasshouse pot trial was performed at the University of Tasmania to observe and record the response of plants amended with the toilet compost.

An analysis was undertaken of the socio-cultural problems encountered when introducing new or improved Agricultural Sanitation systems into various communities. The implementation policies of Agricultural

Sanitation system projects are reviewed and examined in Kiritimati, Tonga, El Salvador, Guatemala, Pakistan and Vietnam to determine the main features constraining and enabling implementation in various socio-cultural situations.

It was found that the technical and biological issues related to Agricultural Sanitation utilizing alternating batch composting toilets are not the most significant factors preventing the adoption of this method of excreta management. Evidence from the historical investigation and the review of contemporary use of human excreta in cultivation suggests human excreta is a valuable resource in those cultures. The results from observations and analyses of compost samples from the batch composting toilets revealed that human excreta compost was aesthetically acceptable, useful, and potentially safe. The major constraint to the sustainable introduction of this excreta management strategy appeared to be resistance to the required changes in behaviour. Therefore attention to complex socio-cultural factors is the principle requirement for successful technology transfer.

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